

# Work Order ID 48575

June 26, 2009 8:19:13 AM



Page 1

Item ID: D350-748-101

Accept



Setup Start



Revision ID: D

Stop



Item Name: Crosstube Installation, High Fwd

Start Date: 15/07/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 03/08/2009 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

N/A

Rev D

100

0.00



DC

Document Control

DOCUMENT CONTROL

Memo

for BG 09/09/01  
Photocopy bluefile & type labels per PPPD350-748-101

CHG001

S 09/09/02

110

0.00



CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and  
Folio FT

DP 9-7-17

120

0.00



QC

Quality Control

QC15- Crosstube Dimensional Check

Memo

0.00

\*B48575

1 0 150722

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Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

130

0.00



Crosstubes

Crosstubes

Memo

0.00

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, :  
Set-up drill table as per QSI 0101 12-Deburr 3-Engrave Part # and Batch # as  
per Dwg D350-748-141 14-Remove all marks from tube within limits of D350-  
748-141 15- Apply a light coat of - M109956 AWM 9-7-23

MB 09-07-22 (1X)

(1) /

- AWM 9-7-22

140

0.00



QC

Quality Control

QC5- Inspect part completeness to step on W/O

Memo

0.00

CHECK 10 DEG HOLES WITH DT8876E(EUROCOPTER CLAMP)

⇒ S o r l u b x (10) /

150

0.00



Outsource3

Outsource process - Cad plate

Outsource process-Cadplate per QSI017 4.1.9.1

Memo

0.00

Issue P/O: 10132 Stress relief at 375° for 5 hours Magnetic  
Particle Inspect per ASTM E1444 Cadmium Plate per AMS-QQ-P-416B, Class  
1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible  
Supplier: Southwest United Industries Ens

u 09-07-27

# Work Order ID 48575

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Item ID: D350-748-101

Accept



Setup Start



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Start Date: 15/07/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 03/08/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

160

Receive & Inspect for Damage & Mat'l Certs

0.00



Packaging

Memo

0.00

Packaging

Ensure certificate of conformity is attached

PC 9/8/18. (C)

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

27 802/00/25

(C) 8

180

SprayPaint

0.00



SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2. i2-Prime Outside of Tube as per Dart QSI 005 4.2

BT 09.08.26

Prime 10:30 - 11:30  
Paint 3:30 - 4:30

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Cust Item ID:

Required Date: 03/08/2009 Req'd Qty: 1.00

Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

190

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

09 08 31 ①

200

Crosstubes

0.00



Crosstubes

Memo

0.00

Crosstubes

1-Install Ground wire Insert, then insert screw and washer; 2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035; 3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

09 08 31 ①

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

2> 8 09/08/31

④

# Work Order ID 48575

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Page 5

Item ID: D350-748-101

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Setup Start



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Stop



Start Date: 15/07/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 03/08/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: Date:

Tooling: Date:

Run Start



QC: Date:

SPC (Y/N): Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

220

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

9/9/2

10 Sp

230

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

=) S or b or l o 2

20 f

240

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D350-748-101 Location: \_\_\_\_\_ PPP Rev: \_\_\_\_\_

B

11/9/2 20 Sp

# Work Order ID 48575

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Item ID: D350-748-101

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Setup Start



Revision ID: D

Item Name: Crosstube Installation, High Fwd

Stop



Start Date: 15/07/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 03/08/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

250

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09109103 *[Signature]*

MF 09-09-03

# Picklist Print

June 26, 2009 8:19:13 AM

Page 1 *12*

Work Order ID: 48575

Parent Item: D350-748-101RevD

Parent Item Name: Crosstube Installation, High Fwd










Comments:

Start Date: 15/07/2009

Required Date: 03/08/2009

Start Qty: 1.00

Required Qty: 1.00

| Component Item ID/<br>Item Name  | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Remaining<br>Qty To Pick | Qty<br>Issued | Date<br>Issued | Status |
|--|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|--------------------------|---------------|----------------|--------|
| <i>S</i> ✓ MS21042L5<br>    |                        | Purchased     | No          |                     |                  | 120             | Each               | 0.0000         | 4.0000                   |               |                |        |
| Nut  |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ ALS4-1032-225<br>         |                        | Purchased     | No          |                     |                  | 200             | Each               | 0.0000         | 1.0000                   |               |                |        |
| Insert   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ AN960JD10<br>             |                        | Purchased     | No          |                     |                  | 200             | Each               | 0.0000         | 1.0000                   |               |                |        |
| Washer   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ D2856-400RevA<br>         |                        | Manufactured  | No          |                     |                  | 200             | f                  | 0.0000         | 1.2432                   |               |                |        |
| Abraison Strip   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ D3502-1RevB<br>           |                        | Manufactured  | No          |                     |                  | 200             | Each               | 0.0000         | 2.0000                   |               |                |        |
| Support  |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ D350-748-141TRNRevD<br> | B-47159                | Manufactured  | No          |                     |                  | 200             | Each               | 0.0000         | 1.0000                   |               |                |        |
| Crosstube Turning Detail   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ MS21920-20<br>          |                        | Purchased     | No          |                     |                  | 200             | Each               | 0.0000         | 2.0000                   |               |                |        |
| Clamp (per MIL-DTL-8783C)  |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ AN4-6A<br>              |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 16.0000                  |               |                |        |
| Bolt   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ AN5-32A<br>             |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 4.0000                   |               |                |        |
| Bolt   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |

*M111636 SP*

*110768 ml 09.08.31*

*111668 ml 09.08.31*

*50593 ml 09.08.31*

*47120 ml 09.08.31*

*47159 SP*

*111284 ml 09.08.31*

*M111279 SP*

*M111916 8/12 @ SP*

# Picklist Print

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Work Order ID: 48575

Parent Item: D350-748-101RevD

Parent Item Name: Crosstube Installation, High Fwd






Comments:

Start Date: 15/07/2009

Required Date: 03/08/2009

Start Qty: 1.00

Required Qty: 1.00

| Component Item ID/<br>Item Name   | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Remaining<br>Qty To Pick | Qty<br>Issued | Date<br>Issued | Status |
|---|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|--------------------------|---------------|----------------|--------|
| ✓ AN960JD416<br>   |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 32.0000                  |               |                |        |
| Washer  |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ AN960JD516<br>   |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 8.0000                   |               |                |        |
| Washer  |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ D3501-1RevA<br>  |                        | Manufactured  | No          |                     |                  | 230             | Each               | 0.0000         | 16.0000                  |               |                |        |
| Bushing   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ MS21042L4<br>    |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 24.0000                  |               |                |        |
| Nut   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |
| ✓ MS27039-1-10<br> |                        | Purchased     | No          |                     |                  | 230             | Each               | 0.0000         | 1.0000                   |               |                |        |
| Screw   |                        |               |             |                     |                  |                 |                    |                |                          |               |                |        |

M11916 SP

M112082 SP

B45402 SP

M110507 9/9/2 SP (10)

111425 11/09/08 31

✓ AN4-41A M112082 SP (8x) 4

✓ D 3500-1 47350 SP 9/9/2 (12) (4x)

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Shop Packet Print

Page 2



Date: Monday, 15/06/2009 9:49:38 AM  
 User: Julie Dawson

## Process Sheet

|                                    |   |                           |                       |
|------------------------------------|---|---------------------------|-----------------------|
| <b>Customer</b> :                  | CU-DAR001 Dart Helicopters Services   | <b>Drawing Name</b> :     | 350/355 AS X-TUBE FWD |
| <b>Job Number</b> :                | 48575   |                           |                       |
| <b>Estimate Number</b> :           | 12485   |                           |                       |
| <b>P.O. Number</b> :               |   | <b>Part Number</b> :      | D350748101            |
| <b>This Issue</b> :                | 15/06/2009  | <b>S.O. No.</b> :         |                       |
| <b>Prsht Rev.</b> :                | NC  | <b>Drawing Number</b> :   | N/A                   |
| <b>First Issue</b> :               | //  | <b>Project Number</b> :   | N/A                   |
| <b>Previous Run</b> :              | 47081   | <b>Drawing Revision</b> : | D                     |
|                                    | <b>Type</b> :   | <b>Material</b> :         |                       |
|                                    | CROSSTUBES  | <b>Due Date</b> :         | 10/07/2009            |
| <b>Written By</b> :                |   | <b>Qty:</b>               | 1 Um: Each            |
| <b>Checked &amp; Approved By</b> : | <u>JWD 09-06-15</u>   |                           |                       |
| <b>Comment</b> :                   | Est Rev:A New Issue 06-07-05 JLM<br>Est Rev:B Update qty of MS21042L5 06-09-12 KJ<br>Est Rev:C Rev B 07-11-15 DD<br>Est Rev D Combined manufacturing 08.04.02 EC verified by:<br>DD<br>Est Rev:E 08-06-24 revD as per dwg DD verified by:EC |                           |                       |

## Additional Product

Job Number:



|                |                              |                      |
|----------------|------------------------------|----------------------|
| <b>Seq. #:</b> | <b>Machine Or Operation:</b> | <b>Description :</b> |
|----------------|------------------------------|----------------------|

|     |      |                  |
|-----|------|------------------|
| 1.0 | ✓ DC | DOCUMENT CONTROL |
|-----|------|------------------|



**Comment:** Photocopy bluefile & type labels per PPPD350-748-101 CHG001

|     |                 |                          |
|-----|-----------------|--------------------------|
| 2.0 | ✓ D350748141TRN | Crosstube Turning Detail |
|-----|-----------------|--------------------------|



**Comment:** Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)  
 CROSSTUBE TURNING DETAIL  
 batch \_\_\_\_\_

|     |           |                             |
|-----|-----------|-----------------------------|
| 3.0 | ✓ BENDING | BENDING MACHINE - SKIDTUBES |
|-----|-----------|-----------------------------|



**Comment:** BENDING MACHINE  
 Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT \_\_\_\_\_

|     |        |                              |
|-----|--------|------------------------------|
| 4.0 | ✓ QC15 | DIMENSIONAL CHECK OF X-TUBES |
|-----|--------|------------------------------|



**Comment:** DIMENSIONAL CHECK OF X-TUBES

|     |              |                       |
|-----|--------------|-----------------------|
| 5.0 | ✓ CROSSTUBES | CROSSTUBES RESOURCE 1 |
|-----|--------------|-----------------------|



**Comment:** LANDING GEAR RESOURCE 1

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs,  
 Set-up drill table as per QSI 010

2-Deburr

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

Date: Monday, 15/06/2009 9:49:38 AM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 48575

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

3-Engrave Part # and Batch # as per Dwg D350-748-141

4-Remove all marks from tube within limits of D350-748-141

5- Apply a light coat of LPS3 on the interior of tube

Batch: \_\_\_\_\_

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

CHECK 10 DEG HOLES WITH DT8876E(EUROCOPTER CLAMP)

7.0

OUTSIDE SERV.11

OUTSIDE SERVICE -CROSSTUBES



Comment: Sub-Contracting OUTSIDE SERVICES

Issue P/O: \_\_\_\_\_

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possible Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

8.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformity is attached

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

10.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside crosstube as per QSI 005 4.2

2-Prime Outside of Tube as per Dart QSI 005 4.2

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

Date: Monday, 15/06/2009 9:49:38 AM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 48575

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

18.0



CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install Ground wire Insert, then insert screw and washer

2-Install Abraison strips as per Dwg D350-748-141 & QSI 035.

3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

19.0



QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

20.0



PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

21.0



D35001

Saddle



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
350 SADDLE

Batch: \_\_\_\_\_

22.0



D35011

Bushing



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)  
BUSHING

Batch: \_\_\_\_\_

23.0



AN46A

Bolt



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)  
Bolt

Batch: \_\_\_\_\_

24.0



AN441A

bolt



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)  
bolt  
Batch: \_\_\_\_\_

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

Date: Monday, 15/06/2009 9:49:38 AM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 48575

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

25.0

✓ AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: \_\_\_\_\_

26.0

✓ AN960JD416

Washer



Comment: Qty.: 32.0000 Each(s)/Unit Total : 32.0000 Each(s)

Washer

Batch: \_\_\_\_\_

27.0

✓ AN960JD516

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Washer

Batch: \_\_\_\_\_

28.0

✓ MS21042L4

Nut



Comment: Qty.: 24.0000 Each(s)/Unit Total : 24.0000 Each(s)

Nut

Batch: \_\_\_\_\_

29.0

✓ MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut

Batch: \_\_\_\_\_

30.0

✓ QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

31.0

✓ PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D350-748-101

Location: \_\_\_\_\_

PPP Rev: \_\_\_\_\_

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries



Date: Monday, 15/06/2009 9:49:38 AM  
User: Julie Dawson

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 48575

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

32.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

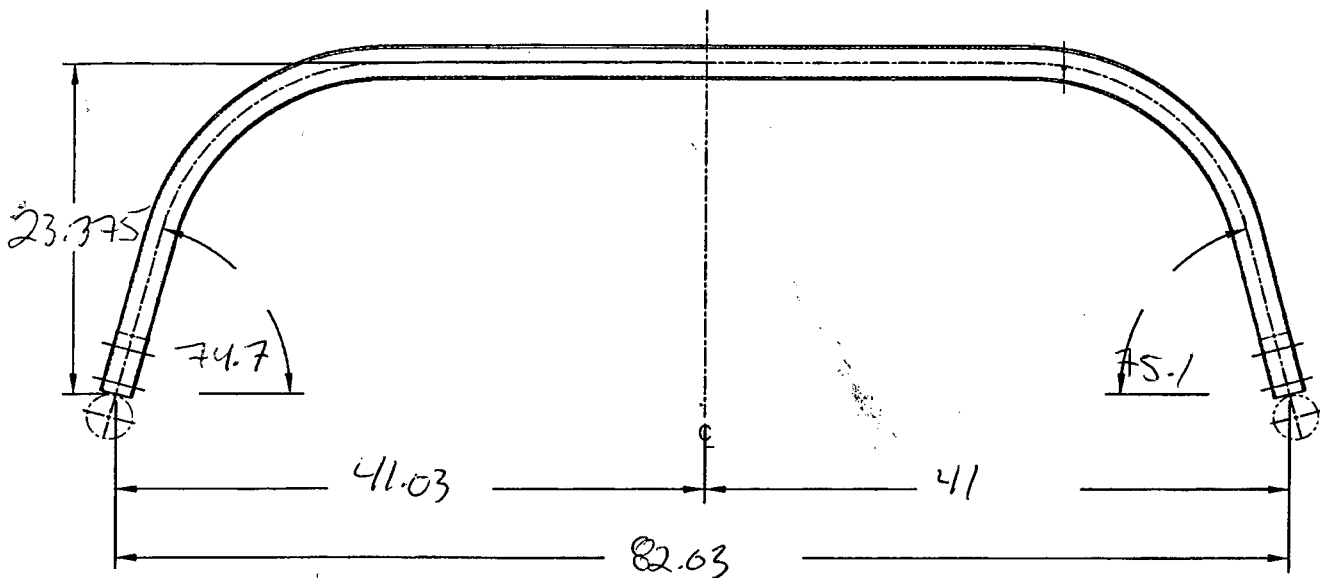
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

|  |  |                                  |
|--|--|----------------------------------|
| <b>DART AEROSPACE LTD</b>                          |  | <b>Work Order:</b> 148525        |
| <b>Description:</b> Crosstube High Fwd (AS350/355) |  | <b>Part Number:</b> D350-748-101 |
| <b>Inspection Dwg:</b> D350-748-141 <b>Rev:</b> D  |  | <b>Page 1 of 1</b>               |

| Required Dimension | Min   | Max   |
|--------------------|-------|-------|
| Height             | 23.13 | 23.37 |
| 1/2 Span           | 40.78 | 41.02 |
| Angle              | 75    | 77    |
| Total Span         | 81.56 | 82.04 |



| 0.338 # | Comments   |
|---------|--|
| A       | 0.445 twist from cuff to cuff, when set flat on the drill table. |
|         | OK # 09.07.21  |

|                 |          |
|-----------------|----------|
| QC15 Inspection |          |
| Date            | 09.07.22 |

| Rev | Date     | Change    | Revised by | Approved    |
|-----|----------|-----------|------------|-------------|
| A   | 07.02.06 | New Issue | KJ/JM      | [Signature] |

**DART**

RELEASED

06.10.31

|                  |                |  |                        |
|------------------|----------------|--|------------------------|
| DESIGN<br>9P     | DRAWN BY<br>9P | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA |                        |
| CHECKED<br>H     | APPROVED<br>H  | DRAWING NO.<br>D350-748-141                              | REV. D<br>SHEET 1 OF 3 |
| DATE<br>06.10.31 |                | TITLE<br>CROSSTUBE (AS 350/355 HI FWD)                   | SCALE<br>NTS           |
| A                | 06.03.31       | NEW ISSUE  |                        |
| B                | 06.06.30       | ADD D6017-115 & PRIME AND PAINT                          |                        |
| C                | 06.08.14       | ADD CAD PLATING  |                        |
| D                | 06.10.31       | MAG. PARTICLE AND CAD PLATE AS MFD.                      |                        |

| QTY | P/N           | DESCRIPTION                            |
|-----|---------------|--|
| X   | D350-748-141  | CROSSTUBE ASSEMBLY (AS 350/355 HI FWD) |
| 1   | D6017-115     | CROSSTUBE (OR D6015-125)               |
| 2   | D3502-1       | SUPPORT                                |
| 2   | D2856-400-710 | ABRASION STRIP                         |
| 1   | AELS-1032-225 | INSERT                                 |
| 1   | AN960JD10     | WASHER                                 |
| 2   | MS21920-20    | CLAMP (PER DART SPEC. M-MS21920-20)    |
| 1   | MS27039-1-10  | SCREW                                  |

UNDER REVIEW

09.02.05

PER PCR #09.001

**D350-748-141 CROSSTUBE:**

- 1) MATERIAL: MANUFACTURED FROM D6017-115 OR D6015-125  
FINISHED LENGTH = 110.27±0.06
- 2) MACHINE PER MACHINING DETAIL ON PAGE 3. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITIONS SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 3) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 4) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 5) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING
- 6) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 7) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 8) INSTALL D2856-400-710 ABRASION STRIP WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 9) TORQUE MS21920-20 CLAMPS 60 TO 80 IN-LB
- 10) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 11) ALL DIMENSIONS ARE IN INCHES
- 12) PART IS SYMMETRIC ABOUT CENTERLINE EXCEPT FOR Ø0.297 HOLE.

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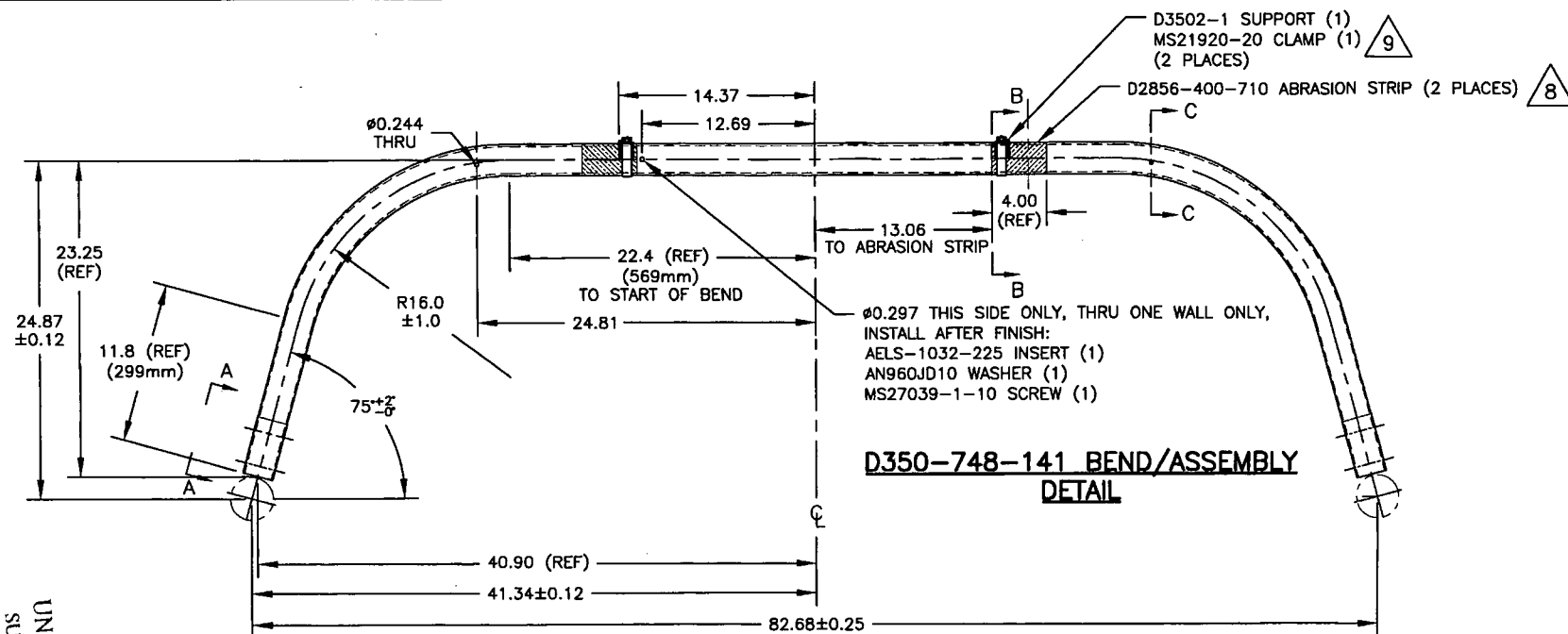
NO. 48525

UNDER REVIEW

OK 07.10.22

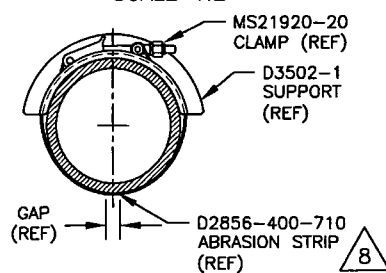
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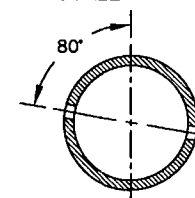
#### SECTION B-B

SCALE 1:2



#### SECTION C-C

SCALE 1:2



UNDER REVIEW

09.02.05

UNDER REVIEW

09.02.16

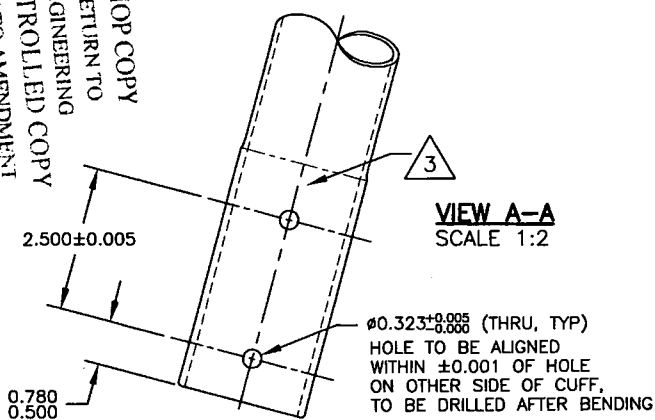
OK 09.10.22

RELEASED

06.10.31

NO 48575

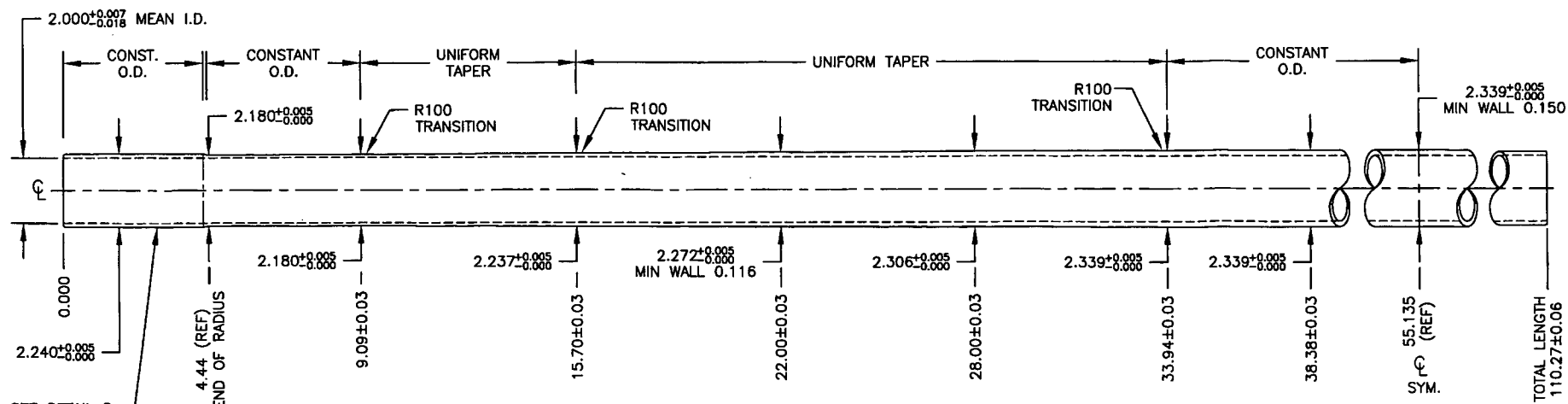
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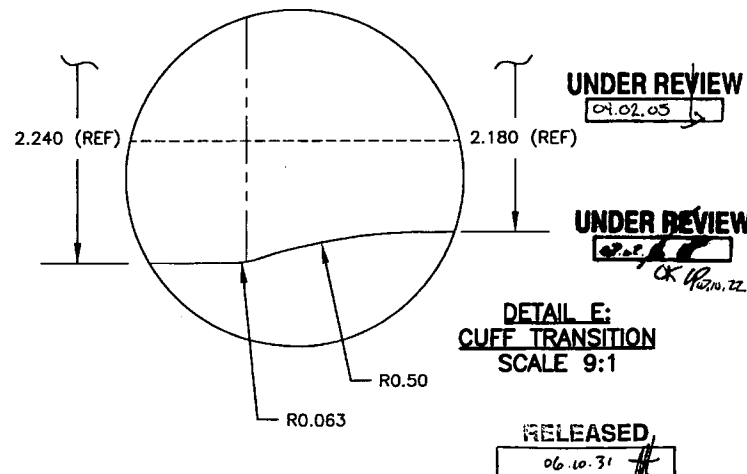
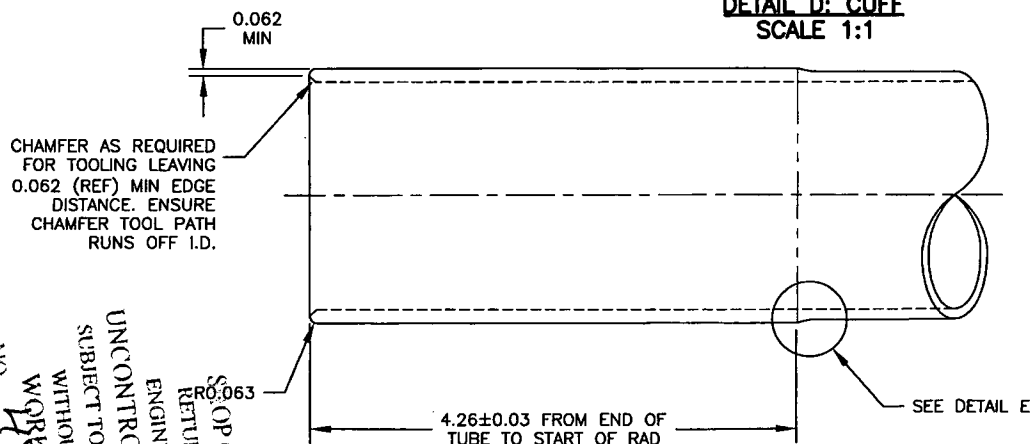
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|         |          |          |                               |             |  |
|---------|----------|----------|-------------------------------|-------------|--|
| DESIGN  | 90       | DRAWN BY | 90                            | <b>DART</b> | DART AEROSPACE LTD.<br>HARRISBURG, ONTARIO, CANADA |
| CHECKED | #        | APPROVED | #                             | DRAWING NO. | D350-748-141                                       |
| DATE    | 06.10.31 | TITLE    | CROSSTUBE (AS 350/355 HI FWD) | REV. D      | SHEET 2 OF 3                                       |
|         |          |          |                               | SCALE       | 1:8  |



**D350-748-141 MACHINING DETAIL**

**DETAIL D: CUFF  
SCALE 1:1**



|  |          |                               |          |   |        |
|--|----------|-------------------------------|----------|---|--------|
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| CHECKED  | APPROVED | 06.10.31                      | 06.10.31 | DRAWING NO.   | REV. D |
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| DATE   |          | TITLE                         |          | SCALE   |        |
| 06.10.31   |          | CROSSTUBE (AS 350/355 HI FWD) |          | 1:3   |        |

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**CERTIFICATE OF  
CONFORMANCE**

**CADORATH PLATING CO. LTD.  
2150 LOGAN AVENUE  
WINNIPEG, MANITOBA R2J-0J1**

**DATE:** Aug-14-2009

**CONSIGNED TO:** Dart Aerospace Ltd.  
1270 Aberdeen St.  
Hawksbury, ON K6A 1K7

**W/O #:** 88569

**INVOICE #:** 45705

**CONTRACT OR  
PURCHASE ORDER # 513963**

**DESCRIPTION:** SKID

**QTY** 1

**P/N #** d350-748-101

**S/N #** B48575

**STRESS RELIEF BAKE @ 375 DEG. FOR 5 HRS. BAKE HEAT CHART  
#10734. MPI INSPECTED IAW ASTM-E-1444. CADMIUM PLATED IAW  
AMS-QQ-P-416B, TYPE 2 YELLOW, CLASS 2. BAKE HEAT CHART  
#10785.**

*8/14/09*

**CERTIFICATE: I certify that the items indicated here on have  
been inspected and tested and conform to all specifications  
and requirements detailed on the contract or purchase order.**

**Approved Inspector:**



A large, stylized handwritten signature or scribble over a horizontal line.

## 5.0 PARTS LIST

| Qty<br>-101 | Qty<br>-201 | Part Number   | Description                                 |
|-------------|-------------|---------------|---|
| X           |             | D350-748-101  | CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD |
|             | X           | D350-748-201  | CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT |
| 1           |             | D350-748-141  | CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD     |
|             | 1           | D350-748-241  | CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT     |
| *2          | *2          | D3502-1       | SUPPORT                                     |
| *2          | *2          | D2856-400-710 | ABRASION STRIP                              |
| *1          | *1          | AELS-1032-225 | INSERT                                      |
| *2          | *2          | MS21920-20    | CLAMP                                       |
| *1          | *1          | MS27039-1-10  | SCREW                                       |
| *1          | *1          | AN960JD10     | WASHER                                      |
| 4           | 4           | D3500-1       | SADDLE                                      |
| 16          | 16          | D3501-1       | BUSHING                                     |
| 16          | 16          | AN4-6A        | BOLT  |
| 8           | 8           | AN4-41A       | BOLT  |
| 4           | 4           | AN5-32A       | BOLT  |
| 32          | 32          | AN960JD416    | WASHER                                      |
| 8           | 8           | AN960JD516    | WASHER                                      |
| 24          | 24          | MS21042L4     | NUT (OR MS21042-4)                          |
| 4           | 4           | MS21042L5     | NUT (OR MS21042-5)                          |

\* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

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Revision: **B**

Date: 07.06.15